IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

BEAN et al.	Atty. Ref.: 3638-116 (AMK)
Serial No. 10/786,158	TC/A.U.: 3634
Filed: February 26, 2004	Examiner: A. Chin Shue

For: LIFT VEHICLE WITH MULTIPLE CAPACITY ENVELOPE CONTROL SYSTEM AND METHOD

* *

March 10, 2008

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellants hereby **appeal** to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

TABLE OF CONTENTS

(I) REAL PARTY IN INTEREST

The real party in interest is JLG Industries, Inc., a corporation of Pennsylvania.

(II) RELATED APPEALS AND INTERFERENCES

The Appellants, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this Appeal.

(III) STATUS OF CLAIMS

Claims 1-23 are present in this application. Claims 1-12 are on appeal, and claims 13-23 have been withdrawn from consideration.

(IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the last Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates to an aerial work platform vehicle including a multiple capacity system with multiple envelope control. With reference to FIG. 1, an aerial work platform (AWP) vehicle 10 generally includes a vehicle base 12 supported by a plurality of wheels 14. A counterweight 16 is fixed to the vehicle base 12 to counterbalance turning moments generated by the vehicle boom components. The vehicle base 12 also houses suitable drive components coupled with the vehicle wheels 14 for driving the vehicle. See page 6, lines 4-8.

A telescoping tower boom 18 is pivotally coupled at one end to the vehicle base 12. A lifting member 20 such as a hydraulic cylinder is disposed between the tower boom 18 and the vehicle base 12 for effecting tower lift functions. The tower boom 18 includes telescope sections that are coupled with suitable driving means to effect telescope extend/retract functions. A nose pin 22 of the tower boom is disposed at an uppermost end of the tower boom 18 opposite the end pivotally attached to the vehicle base 12. See page 6, lines 9-15.

A main boom 24 is pivotally coupled to the tower boom 18 at the tower boom nose pin 22. The lifting mechanism 26 drives a position of the main boom 24 relative to the tower boom 18. An aerial work platform 28 is supported by a jib arm 29 pivotally secured to an outermost end of the main boom 24. See page 6, lines 16-22.

In contrast with conventional articulating AWP vehicles, the tower boom 18 and the main boom 24 are without a conventional upright between them. The vehicle 10 rather utilizes sensors for sensing an angle of the main boom relative to gravity. In

particular, an inclinometer 30 is attached to the tower boom 18 for measuring an angle of the tower boom 18 relative to gravity. A rotation sensor 32 is coupled between the tower boom 18 and the main boom 24 for determining a relative position of the tower boom 18 and the main boom 24. A control system 34 controls lift and telescope functions of the tower boom 18 and the main boom 24. Output from the inclinometer 30 and the rotation sensor 32 are processed by the controller 34, and the main boom angle relative to gravity can thus be determined. Alternatively, an inclinometer may be coupled directly with the main boom. See page 6, line 23 – page 7, line 6.

With reference to FIGS. 2 and 4, a plurality of sensors detect various positions of the vehicle components, which ultimately can be used to determine a position of the platform 28. The sensors include tower length sensor 38, tower angle sensor 30, main boom angle sensor 32, main boom transport length switches 44, and multiple capacity length switches 46. The tower length sensor 38 communicates with the control system 34 to determine a telescoped length of the tower boom 18. The main boom angle sensor 32 communicates with the controller 34 to determine an angle of the main boom 24 relative to the tower boom 18. See page 7, lines 7-19.

The plurality of sensors 30, 32, 38, 44, 46 are strategically positioned on the vehicle 10 to cooperatively define position zones of the aerial work platform 28. With reference to FIG. 3, the position zones defined by the plurality of sensors generally include eight angle regions 48 (R1-R8) and four length regions 50 (A-D). The angle regions 48 correspond to an angle of the main boom 24 relative to gravity. The length

regions 50 correspond to the telescope length of the main boom 24. See page 7, lines 20-29.

A selector switch 36 enables the operator to select between a plurality of capacity modes including at least a low load mode and a high load mode. In the high load mode, the control system 34 selectively prevents one or both of the main lift/lower functions and the main telescope function based on which position zone the aerial work platform 28 is located in. Table 1 on page 8 of the specification lists the functions of the main boom 24 as main lift up, main lift down, main telescope out, and main telescope in. The control system permits the noted functions depending on the position zone in which the aerial work platform 28 is located. Table 1 lists the angle regions 48 in which the functions are permitted according to which length region 50 is detected. See page 8, lines 1-11 and Table 1.

With reference to FIG. 4 and Table 2, each of the main transport switches 44 rides on respective cam surfaces 51, 52 as the main boom 24 is telescoped in and out. Similarly, the multiple capacity switches 46 each rides on respective cam surfaces 53, 54. Depending on whether the switch combination 44, 46 is "on cam" or "off cam," the control system 34 can determine in which length zone the main boom 24 is positioned. Table 2 on page 9 of the specification lists the possible readings of the transport switches 44 and the multiple capacity switches 46 and the control system's 34 respective conclusion regarding the length region 50 for each set of switches. With this information, the control system 34 makes the conclusion of main boom length (length region) based

on the separate conclusions from the respective switches 44, 46. See page 8, line 23 – page 9, line 6 and Table 2.

In operation, the control system 34 displays the selected capacity mode on both platform and ground displaying panels, and as noted, controls the positions of the boom within the allowable envelope for that mode. See page 9, lines 20-33.

Specific Support for Independent Claims

1. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode; **[**page 8, lines 1-3**]**

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and **[**page 7, lines 20-21**]**

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in. **[**page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22**]**

5. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being

configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode; [page 8, lines 1-3]

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and [page 7, lines 20-21]

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls an envelope of the platform based on a position of the selector switch, [page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22]

wherein the position zones defined by the plurality of sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom. [page 7, lines 20-29]

12. A lift vehicle comprising:

a vehicle base; [page 6, lines 4-8]

a tower boom pivotally coupled at one end to the vehicle base; [page 6, lines 9-15]

a telescoping main boom pivotally coupled to the tower boom at an opposite end thereof; [page 6, lines 16-20]

a platform mounted to the telescoping main boom, the telescoping main boom being configured for lift/lower function and telescope function; and [page 6, lines 16-22]

a multiple envelope control system including:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode, [page 8, lines 1-3]

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform, and [page 7, lines 20-21]

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in. [page 7, lines 7-17; page 8, lines 1-7; and page 9, lines 20-22]

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-12 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 4,456,093 to Finley et al. in view of "Capacity Control System," and U.S. Patent No. 5,058,752 to Wacht et al.

2. Whether claim 12 is unpatentable under 35 U.S.C. §103(a) over Finley in view of "Capacity Control System," Wacht, and U.S. Published Patent Application No. 2003/0173151 to Bodtke et al.

(VII) ARGUMENT

1. Claims 1-12 are not unpatentable under 35 U.S.C. §103(a) over Finley in view of "Capacity Control System," and Wacht et al.

At the outset, Appellants respectfully submit that the Office Action fails to set forth a *prima facie* case of obviousness. As in previous rejections, in discussing the Finley patent, the Office Action merely provides that "Finley shows the claimed system with the exception of the selector switch for switching between a high and low load capacity and limit switches." The Office Action does not reference where in the Finley patent any of the claimed features are disclosed or suggested. In fact, the Office Action does not reference a single passage or drawing element in the Finley patent. As discussed in more detail below, there are clear and significant distinctions between the invention and the Finley patent, taken singly or in combination with the "Capacity Control System" article and/or the Wacht publication.

With reference to claim 1, Finley, "Capacity Control System" and Wacht lack at least the claimed plurality of sensors strategically positioned on the main boom that cooperatively define <u>position zones</u> of the platform. A "zone" by its very definition comprises a certain range or area, which is consistent with the description in the specification, rather than a discrete point. As described in the specification, by defining position zones of the platform, rather than utilizing sensors for determining exact (discrete) platform positions, considerably less expensive limit switches and the like may be used. In contrast, the Finley system utilizes continuous devices that are effective to determine an exact (discrete) position of the platform. Finley describes exemplary

devices as a pendulum transducer, length transducer, pressure transducer, and load cells. See, for example, column 9, lines 43-55.

Although the Office Action references "limit switches as taught by Wacht," Appellants submit that the mere disclosure of limit switches falls short of the claimed invention, in particular, at least the claimed plurality of sensors strategically positioned on the main boom that cooperatively define position zones of the platform. Wacht in fact discloses a single limit switch 54 that serves to indicate whether a boom length is beyond a set limit position. At extended boom lengths, an overload warning and control system generates a warning signal at a lower sensed moment load than if the boom were retracted to a relatively shorter length.

Finley, "Capacity Control System" and Wacht also lack the claimed control system that receives output from the plurality of sensors <u>to determine in which position zone the platform is located</u>. As noted, since the sensors in the Finley device are used for determining a discrete position of the platform, Finley lacks any such control system that communicates with the sensors to determine a platform position zone. Finley, "Capacity Control System" and Wacht still additionally lack any control of a predefined envelope of the platform based on a position of the selector switch and operation of the main boom based on which position zone the platform is located in. The Finley system does not in any manner define a predefined envelope for platform positioning. Rather, the positions of the platform are limited based on a load on the platform, which varies presumably up to the maximum rating of the machine. As such, the boundaries for platform positioning also vary as the load changes. In contrast, as defined in claim 1, for example, the

platform position envelope is <u>predefined</u> for each capacity selection, regardless of the actual load carried on the platform.

Still further, the Office Action recognizes that Finley lacks at least the claimed selector switch for selecting between a plurality of capacity modes including at least a low load load and a high load load. The Office Action contends that "Capacity Control System" teaches the use of such a selector switch and that it would have been obvious to incorporate a selector switch in the Finley system. Appellants respectfully disagree with this conclusion.

In order to operate as intended, the Finley system utilizes a plurality of load cells and pressure transducers for determining a load and a position of the load on the platform. See, for example, column 11, lines 1-13. The control system in Finley limits positions of the platform based on the detected load and its position on the platform. With this structure, the Finley system has no need for the claimed selector switch or the claimed limit switches that define position zones. In fact, the Finley system would not function as intended if the system was modified to include such structure. Even under the Supreme Court's decision in *KSR International Co. v. Teleflex Inc.*, a conclusion of obviousness still requires that there is some teaching, suggestion, or motivation to modify the reference or combine reference teachings. As the proposed modification is in fact contrary to operation of the Finley system, Appellants respectfully submit that there is no such teaching, suggestion or motivation to make the combination asserted in the Office Action.

Appellants thus respectfully submit that the rejection of claim 1 is misplaced.

Independent claim 5 similarly defines a plurality of sensors that cooperatively define position zones of the platform. Claim 5 further recites that the position zones defined by the sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom. As noted, the Finley patent lacks any teaching or suggestion of the claimed position zones as discussed above. As such, Finley also lacks such zones comprising a plurality of angle regions and a plurality of length regions as claimed. The "Capacity Control System" article and Wacht patent do not correct these deficiencies as discussed above. Appellants thus submit that the rejection of claim 5 is also misplaced.

Independent claim 12 defines subject matter related to that defined in claim 1. Appellants thus respectfully submit that the rejection of claim 12 is also misplaced for at least the reasons discussed above with regard to claim 1.

With regard to the dependent claims, Appellants submit that these claims are allowable at least by virtue of their dependency on an allowable independent claim. Moreover, claim 2 recites that the control system is configured such that when the selector switch is in the high load mode, the control system selectively prevents at least one of the lift/lower function and the telescope function based on which position zone the platform is located in. With reference to the comments above, this subject matter is also lacking in Finley and "Capacity Control System." Although claim 2 is included in the rejection, the Office Action does not refer to any teaching in any reference that meets this subject matter.

Claim 3 defines a specific angle of the main boom relative to gravity in which the control system selectively prevents at least one of the lift/lower function and the telescope function. This subject matter is lacking in the references of record. The Office Action contends that Finley "is capable of preventing lifting and lowering between the range, as set forth in claim 3" without any reference to a specific teaching in the Finley patent. It is settled that omissions in a patent disclosure cannot be filled with mere possibilities.

Claim 6 specifies that the position zones defined by the plurality of sensors comprise eight angle regions corresponding to the angle of the main boom relative to gravity and four length regions corresponding to the telescoped length of the main boom, and claim 7 defines a schedule of position zones where the control system is configured to permit the main boom lift/lower function and telescope function. In this context, the Office Action concludes that Finley may "permit functioning, as set forth in claims 6 and 7." Claim 6 and 7, however, define structure that is lacking in Finley, "Capacity Control System" and Wacht. As noted, mere reference to "capability" is insufficient to support the rejection.

Claim 8 recites that the plurality of sensors comprise limit switches. Although the use of limit switches in and of themselves is known, such limit switches are not disclosed in the Finley system and in fact would be unable to provide the functionality required by the Finley system.

Finally, claim 11 recites that the control system controls a position of the selector switch according to a sensed load on the platform. As noted above, no such selector

switch is disclosed in the Finley system nor would such a selector switch be desirable or functional in the Finley system.

Reversal of the rejection is respectfully requested

2. Claim 12 is not unpatentable under 35 U.S.C. §103(a) over Finley in view of "Capacity Control System," Wacht and Bodtke.

Claim 12 defines subject matter similar to that of claim 1. Appellants submit that the Bodtke publication does not correct the deficiencies noted above with regard to Finley, "Capacity Control System" and Wacht As such, Applicants respectfully submit that claim 12 is distinguishable for at least the reasons discussed above with regard to claim 1. Reversal of the rejection is respectfully requested.

CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode;

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in.

2. A multiple envelope control system according to claim 1, wherein the control system is configured such that when the selector switch is in the high load mode, the control system selectively prevents at least one of the lift/lower function and the telescope function based on which position zone the platform is located in.

3. A multiple envelope control system according to claim 2, wherein the control system is configured to selectively prevent at least one of the lift/lower function and the

telescope function when an angle of the main boom relative to gravity is between +55º and -45º.

4. A multiple envelope control system according to claim 1, further comprising alarm means for activating an alarm when the platform is placed in a position outside of the envelope.

5. A multiple envelope control system for a lift vehicle, the lift vehicle including a platform mounted to a telescoping main boom, the main boom being configured for lift/lower function and telescope function, the multiple envelope control system comprising:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode;

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform; and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls an envelope of the platform based on a position of the selector switch,

wherein the position zones defined by the plurality of sensors comprise a plurality of angle regions corresponding to an angle of the main boom relative to gravity and a plurality of length regions corresponding to a telescoped length of the main boom.

6. A multiple envelope control system according to claim 5, wherein the position zones defined by the plurality of sensors comprise eight angle regions corresponding to

the angle of the main boom relative to gravity and four length regions corresponding to the telescoped length of the main boom.

7. A multiple envelope control system according to claim 6, wherein the control system is configured permit the main boom lift/lower function and telescope function according to the following schedule, where A-D correspond to the four length regions and R1-R8 correspond to the eight angle regions:

Functions	A	B	C	D
Main Lift UP	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R8
Main Lift Down	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R5, R6, R7, R8
Main Tele Out	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R7, R8	R1, R2, R7, R8
Main Tele In	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R4, R5, R6, R7, R8	R1, R2, R3, R6, R7, R8

8. A multiple envelope control system according to claim 1, wherein the plurality of sensors comprise limit switches.

9. A multiple envelope control system according to claim 8, wherein the position zones defined by the plurality of sensors comprise a plurality of length regions corresponding to a telescoped length of the main boom, and wherein the limit switches comprise first and second multiple capacity switches and first and second main transport switches, the control system being configured to respectively use opposite cam logic with the multiple capacity switches and the main transport switches to determine in which length region the platform is located.

10. A multiple envelope control system according to claim 9, wherein the position zones defined by the plurality of sensors comprise four length regions (A, B, C, D) corresponding to a telescoped length of the main boom, the control system determining which length region the platform is located in according to the following schedule:

	Switch States/Boom Length Regions								
Multiple Cap. Switch #1 Multiple Cap. Switch #2	Off Cam On Cam	Off Cam On Cam	Off Cam On Cam	Disagree Disagree	On Cam Off Cam	On Cam Off Cam	On Cam Off Cam	Disagree Disagree	Disagree Disagree
Control System Conclusion of Multiple Cap Switches	B/A	B/A	B/A	Disagree	C/D	C/D	C/D	Disagree	Disagree
Main Transport Switch #1 Main Transport Switch #2	Off Cam On Cam	Disagree Disagree	On Cam Off Cam	On Cam Off Cam	On Cam Off Cam	Disagree Disagree	Off Cam On Cam	Off Cam On Cam	Disagree Disagree
Control System Conclusion of Main Transport Switches	A/D	Disagree	B/C	B/C	B/C	Disagree	A/D	A/D	Disagree
Control System Conclusion of Main Boom Length	A	A/B	B	B/C	C	C/D	D	Switch Fault	Switch Fault

11. A multiple envelope control system according to claim 1, wherein the control system controls a position of the selector switch according to a sensed load on the platform.

12. A lift vehicle comprising:

a vehicle base;

a tower boom pivotally coupled at one end to the vehicle base;

a telescoping main boom pivotally coupled to the tower boom at an opposite end thereof;

a platform mounted to the telescoping main boom, the telescoping main boom being configured for lift/lower function and telescope function; and

a multiple envelope control system including:

a selector switch for selecting between a plurality of capacity modes including at least a low load mode and a high load mode,

a plurality of sensors strategically positioned on the main boom, the sensors cooperatively defining position zones of the platform, and

a control system communicating with the selector switch and the plurality of sensors, the control system receiving output from the plurality of sensors to determine in which position zone the platform is located, wherein the control system controls a predefined envelope of the platform based on a position of the selector switch and controls operation of the main boom based on which position zone the platform is located in.

(IX) EVIDENCE APPENDIX

(NOT APPLICABLE)

(X) RELATED PROCEEDINGS APPENDIX

(NOT APPLICABLE)